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Metal Industry Indicators

Indicators of Domestic Primary Metals, Steel, Aluminum, and Copper Activity

August 2002

The primary metals leading index dropped sharply in July, reflecting the recent weakness in some economic indicators. The prospects for continued growth in domestic primary metals activity are more uncertain now. The leading index of metal prices moved up again in June, continuing on its strong upward path. The leading index suggests the possibility of a pickup in some nonferrous metal prices in the near future.

The **primary metals leading index** tumbled 3.3% in July, falling to 127.2 from a revised 131.6 in June. The index's 6-month smoothed growth rate sank to –1.3% from a revised 5.7% in June, its first negative reading in 8 months. The 6-month smoothed growth rate is a compound annual rate that measures the near-term trend. Normally, a growth rate below –1.0% indicates a downward trend for future growth in metals activity, and a rate above +1.0% signals an upward trend.

Only four of the leading index's eight components were available in time to compute the July index value, so it should be considered preliminary. Large decreases in three components, the Institute for Supply Management's PMI, the stock price component, and the length of the average workweek in primary metals establishments, were responsible for the big drop in the index. Only the JOC-ECRI metals price index growth rate increased in July. With only the preliminary July leading index growth rate below –1.0%, it is too early to determine if the primary metals leading index is beginning to signal a downward trend in domestic metal industry activity.

The **steel leading index** increased 0.4% in June, the latest month for which it is available, climbing to 113.6 from 113.2 in May. That marks a 29-month high for this index. The leading index's 6-month smoothed growth rate was unchanged from May's revised 3.5%. Six of the index's nine components moved up in June, with the length of the average workweek in steel mills making the largest positive contribution to the net increase in the leading index. Shipments of household appliances posted the largest negative contribution. The growth rate of the steel leading index continues to signal moderate near-term growth in the U.S. steel industry.

The **aluminum mill products leading index** increased a modest 0.2% in June, moving up to 171.0 from a revised 170.7 in May, but its 6-month smoothed growth rate slowed to 1.5% from a revised 1.9% in May. Commercial and industrial construction contracts posted the largest positive contribution, while the length of the average workweek in aluminum sheet, plate, and foil establishments and new orders for aluminum mill products were the biggest negative contributors. The growth rate of the aluminum mill products leading index continues to signal positive near-term growth in industry activity.

The **primary aluminum leading index** climbed to 83.9 in June from a revised 81.9 in May, a gain of 2.4%. The index's 6-month smoothed growth rate rose to 2.5%, the first positive growth rate in 13 months, up from a revised –2.8% in May. An unusually large increase in the length of the average workweek for the primary aluminum industry accounted for most of the strength in the leading index. The index measuring the trade-weighted average exchange value of other major currencies against the U.S. dollar also posted a sizable increase in June. The S&P stock price index for aluminum companies made the largest negative contribution. The primary aluminum leading index points to continued gains in current industry activity over the next several months. (Tables and charts for the primary aluminum indexes are in a separate file.)

The **copper leading index** dropped 0.8% in June, the index's first decline in 9 months, moving down to 118.4 from a revised 119.4 in May. The index's 6-month smoothed growth rate slowed to 4.1% from a revised 6.5% in May. Four of the index's six components registered moderate declines in June, while only two components moved higher. The copper leading index is now giving a weaker signal of increased growth in domestic copper industry activity in the near future.

Weaker U.S. Dollar Boosts Metals Price Leading Index

The **metals price leading index** advanced 0.6% in June to 115.1 from a revised 114.4 in May, its thirteenth increase in the past

15 months. Meanwhile, the index's 6-month smoothed growth rate eased a bit, slipping to 10.5% from a revised 11.0% in May.

Only one of the three leading index components that were available in time to compute the June index value moved higher. Reflecting a weaker U.S. dollar, the growth rate of the index measuring the trade-weighted average exchange value of other major currencies against the U.S. dollar recorded a strong gain in June. In contrast, the yield spread between the U.S. 10-year Treasury Note and the federal funds rate and the growth rate of the inflation-adjusted value of new orders for U.S. nonferrous metal products both declined. The fourth index component, the growth rate of the Economic Cycle Research Institute's 17-Country Long Leading Index, was available only through May, when it reached an 8-year high.

The growth rate of the inflation-adjusted value of inventories of U.S. nonferrous metal products, which usually moves inversely with metal prices, moved down to –16.8% in June from a revised –16.5% in May. That is the lowest growth rate for this indicator since February 1983.

The growth rates of the both the leading index of metal prices and inventories of nonferrous metal products suggest the possibility of increases for some metal prices in the near future. However, the business cycle and inventories are only two factors in metals price determination. Other factors that affect prices include changes in metals production, speculation, foreign exchange rates, strategic stockpiling, political instability, and production costs.

Table 1.
Leading Index of Metal Prices and Growth Rates of the Nonferrous Metals Price Index, Inventories of Nonferrous Metal Products, and Selected Metal Prices

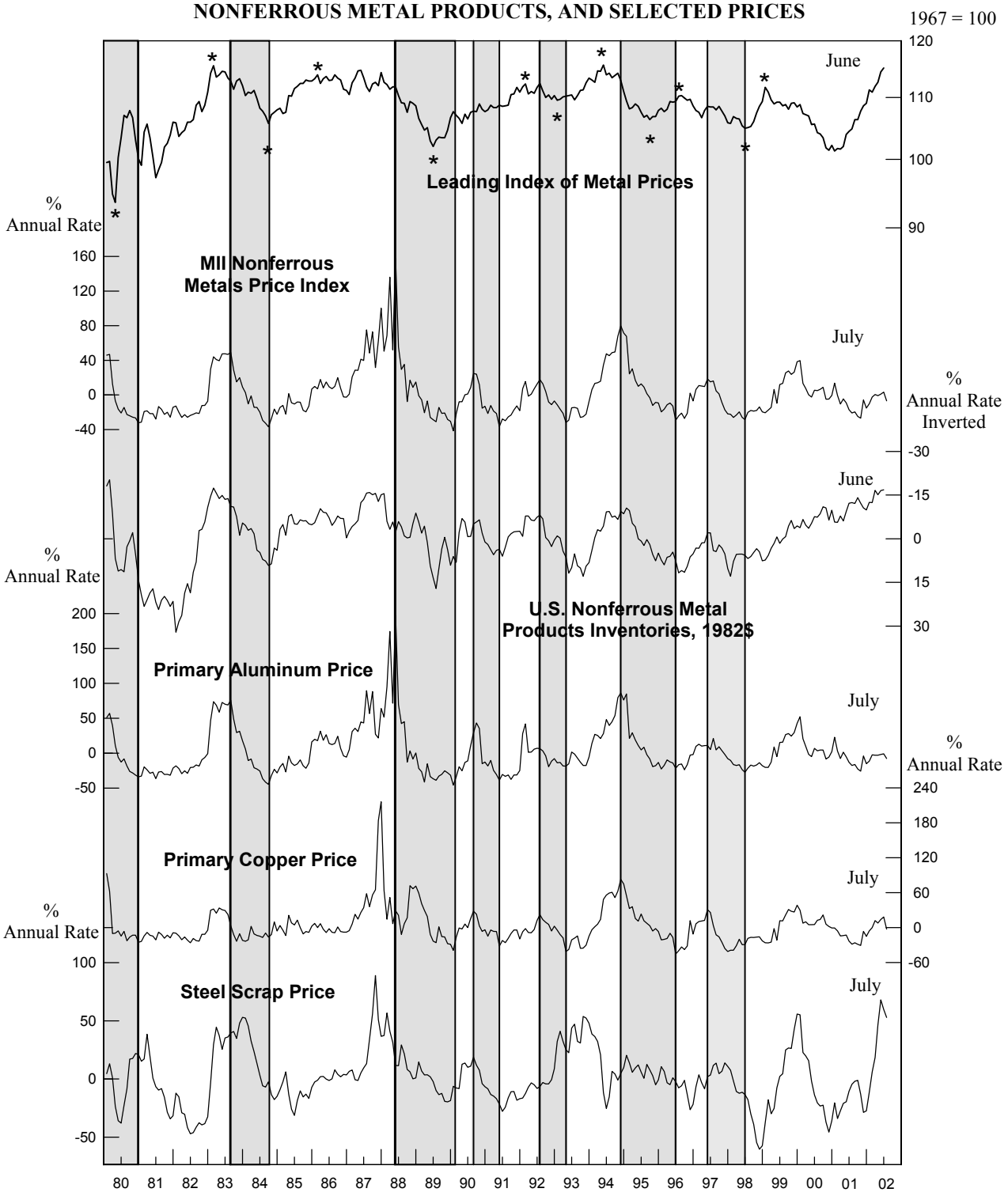
		Six-Month Smoothed Growth Rates				
	Leading Index of Metal Prices (1967=100)	MII Nonferrous Metals Price Index	U.S. Nonferrous Metal Products Inventories (1982$)	Primary Aluminum	Primary Copper	Steel Scrap
2001						
June	104.4r	-17.0	-12.2	-13.1	-23.3	-10.6
July	104.8	-20.9	-12.4	-17.7	-28.5	-4.5
August	106.3r	-19.4	-12.1	-16.2	-26.1	-2.0
September	106.3r	-24.7	-14.1	-22.7	-28.7	-1.2
October	107.7	-26.8	-12.2	-25.7	-30.8	-13.2
November	108.6	-5.8	-10.6	-4.1	-6.5	-28.7
December	109.0	-15.0	-9.9	-15.1	-15.1	-27.4
2002						
January	111.3	-10.2	-12.5	-11.3	-5.8	-11.3
February	110.9r	-2.5	-12.4r	-2.5	0.0	6.0
March	111.9r	0.5	-16.6	-3.0	12.0	18.5
April	112.6r	-0.8	-15.1	-2.9	7.7	46.4
May	114.4r	1.0	-16.5r	-1.8	13.8	68.0
June	115.1	3.4	-16.8	-0.9	18.3	59.8
July	NA	-6.8	NA	-7.7	-2.5	52.9

NA: Not available *r: Revised*

Note: The components of the Leading Index of Metal Prices are the spread between the U.S. 10-year Treasury Note and the federal funds rate, and the 6-month smoothed growth rates of the deflated value of new orders for nonferrous metal products, the Economic Cycle Research Institute's 17-Country Long Leading Index, and the reciprocal of the trade-weighted average exchange value of the U.S. dollar against other major currencies. The Metal Industry Indicators (MII) Nonferrous Metals Price Index measures changes in end-of-the-month prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange (LME). The steel scrap price used is the price of No. 1 heavy melting. Inventories consist of the deflated value of finished goods, work in progress, and raw materials for U.S.-produced nonferrous metal products (NAICS 3313, 3314, & 335929). Six-month smoothed growth rates are based on the ratio of the current month's index or price to its average over the preceding 12 months, expressed at a compound annual rate.

Sources: U.S. Geological Survey (USGS); American Metal Market (AMM); the London Metal Exchange (LME); U.S. Census Bureau; the Economic Cycle Research Institute, Inc. (ECRI); and Federal Reserve Board.

CHART 1.
LEADING INDEX OF METAL PRICES AND GROWTH RATES OF NONFERROUS METALS PRICE INDEX, INVENTORIES OF NONFERROUS METAL PRODUCTS, AND SELECTED PRICES



Shaded areas are downturns in the nonferrous metals price index growth rate. Asterisks (*) are peaks and troughs in the economic activity reflected by the leading index of metal prices. Scale for nonferrous metal products inventories is inverted.

U.S. Geological Survey, August 2002

Table 2.
The Primary Metals Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
2001				
August	126.7r	1.7r	107.4	-6.4
September	127.2r	2.4r	106.5	-7.0
October	123.5	-3.0r	105.4	-7.6
November	125.2r	-0.3	103.4	-9.7
December	127.0r	2.4	102.2	-10.5
2002				
January	128.3r	4.0	103.0	-7.8
February	130.2r	6.4r	102.8	-7.2r
March	131.0r	6.8r	103.7r	-4.5r
April	129.5	3.8r	104.3	-2.7
May	131.2r	5.8r	104.5r	-1.6r
June	131.6r	5.7r	104.5	-0.8
July	127.2	-1.3	NA	NA

NA: Not available *r: Revised*

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 3.
The Contribution of Each Primary Metals Index Component to the Percent Change in the Index from the Previous Month

Leading Index	**June**	**July**
1. Average weekly hours, primary metals (SIC 33)	0.6r	-0.9
2. Weighted S&P stock price index, machinery, construction and farm and industrial (December 30, 1994=100)	-0.5r	-1.3
3. Ratio of price to unit labor cost (SIC 33)	0.2	NA
4. JOC-ECRI metals price index growth rate	0.1	0.2
5. New orders, primary metal products, (NAICS 331 & 335929) 1982$	-0.2	NA
6. Index of new private housing units authorized by permit	0.1	NA
7. Growth rate of U.S. M2 money supply, 1996$	0.0	NA
8. PMI	0.1	-1.4
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.4r	-3.4

Coincident Index	**May**	**June**
1. Industrial production index, primary metals (SIC 33)	0.4r	0.3
2. Total employee hours, primary metals (SIC 33)	-0.2r	0.1
3. Value of shipments, primary metals products, (NAICS 331 & 335929) 1982$	-0.1r	-0.4
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.2r	0.1

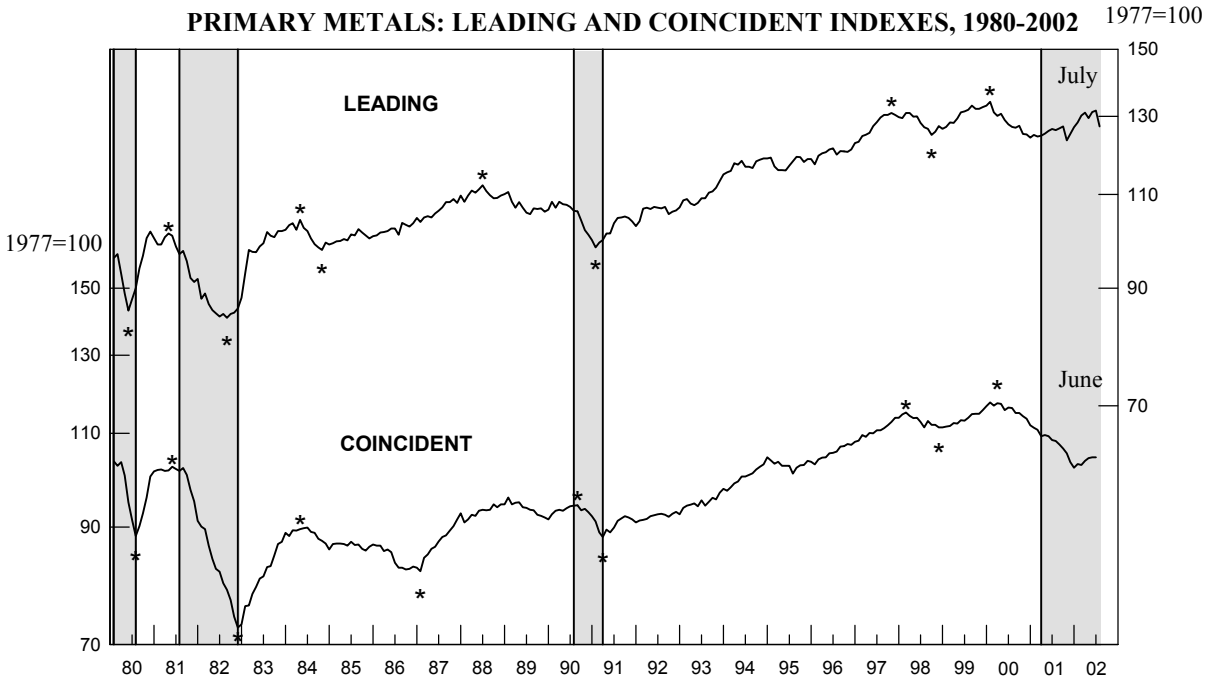
Sources: Leading: 1, Bureau of Labor Statistics; 2, Standard & Poor's and U.S. Geological Survey; 3, U.S. Geological Survey; 4, Journal of Commerce and Economic Cycle Research Institute, Inc.; 5, U.S. Census Bureau and U.S. Geological Survey; 6, U.S. Census Bureau and U.S. Geological Survey; 7, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 8, Institute for Supply Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, U.S. Census Bureau and U.S. Geological Survey. All series are seasonally adjusted, except 2, 3, and 4 of the leading index.

NA: Not available *r: Revised*

Note: A component's contribution, shown in Tables 3, 5, 7, and 9, measures its effect, in percentage points, on the percent change in the index. Each month, the sum of the contributions plus the trend adjustment equals (except for rounding differences) the index's percent change from the previous month.

CHART 2.

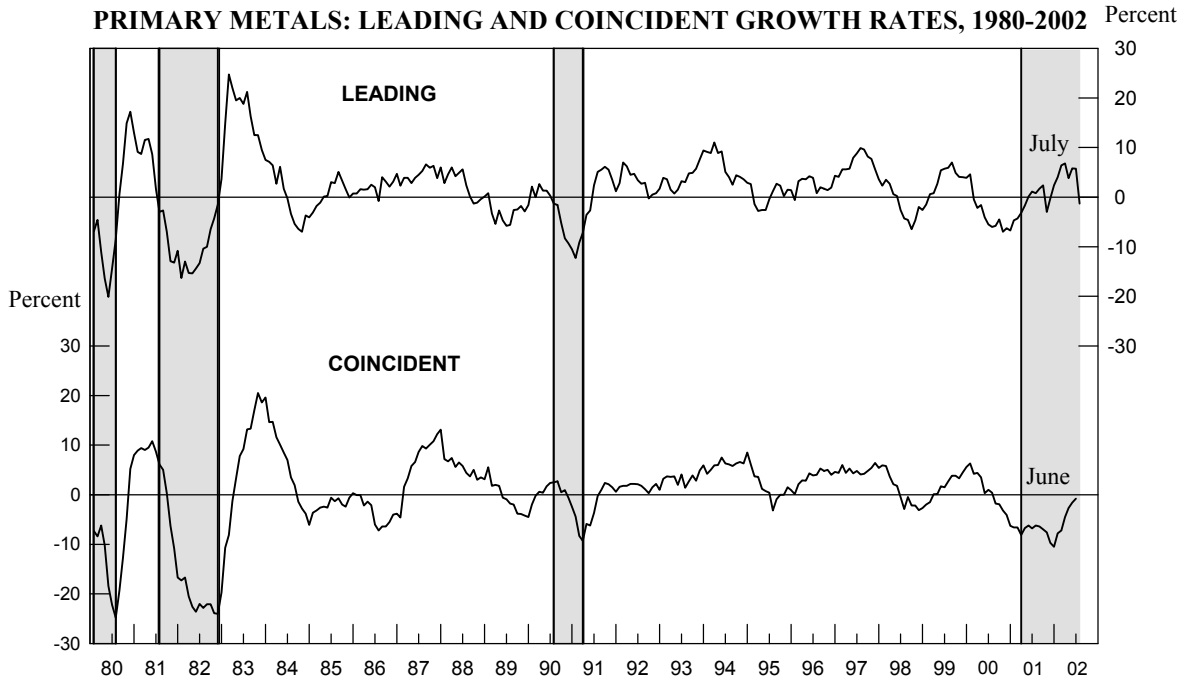
PRIMARY METALS: LEADING AND COINCIDENT INDEXES, 1980-2002



Shaded areas are business cycle recessions. Asterisks (*) signify peaks (the end of an expansion) and troughs (the end of a downturn) in the economic activity reflected by the indexes.

CHART 3.

PRIMARY METALS: LEADING AND COINCIDENT GROWTH RATES, 1980-2002



Shaded areas are business cycle recessions.

The growth rates are expressed as compound annual rates based on the ratio of the current month's index to its average level during the preceding 12 months.

U.S. Geological Survey, August 2002

Table 4.
The Steel Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
2001				
July	109.9r	3.6r	98.6	-3.2
August	111.5r	6.1r	98.3	-3.0
September	112.2r	6.9	97.9	-3.1
October	109.8r	2.3	97.3	-3.4
November	110.1r	2.4r	96.0	-5.2
December	112.0r	5.1r	94.2	-7.8
2002				
January	111.4	3.1r	95.1	-5.3
February	113.0r	5.2r	95.0	-5.0r
March	112.3r	3.0r	95.6	-3.3
April	111.8	1.5r	95.9	-2.3
May	113.2	3.5r	96.7r	-0.2r
June	113.6	3.5	97.0	0.8

r: Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 5.
The Contribution of Each Steel Index Component to the Percent Change in the Index from the Previous Month

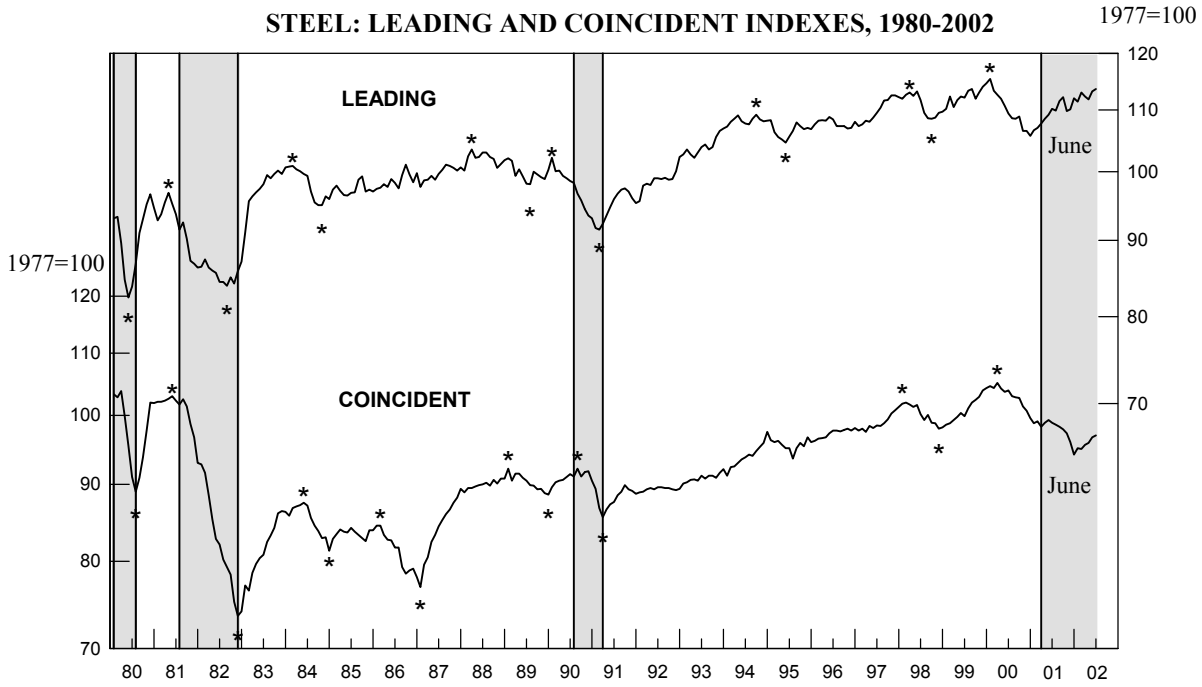
Leading Index	**May**	**June**
1. Average weekly hours, blast furnaces and basic steel products (SIC 331)	0.4	0.4
2. New orders, iron and steel mills (NAICS 3311 & 3312), 1982$	0.0r	-0.2
3. Shipments of household appliances, 1982$	0.1	-0.4
4. S&P stock price index, steel companies	0.1	0.2
5. Retail sales of U.S. passenger cars and light trucks (units)	-0.5r	0.2
6. Growth rate of the price of steel scrap (#1 heavy melting, $/ton)	0.1	0.1
7. Index of new private housing units authorized by permit	0.1	0.1
8. Growth rate of U.S. M2 money supply, 1996$	0.7	0.0
9. PMI	0.2	0.1
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	1.2	0.5
Coincident Index		
1. Industrial production index, basic steel and mill products (SIC 331)	0.7r	0.2
2. Value of shipments, iron and steel mills (NAICS 3311 & 3312), 1982$	-0.3r	-0.2
3. Total employee hours, blast furnaces and basic steel products (SIC 331)	0.3r	0.1
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.8r	0.2

Sources: Leading: 1, Bureau of Labor Statistics; 2, U.S. Census Bureau and U.S. Geological Survey; 3, U.S. Census Bureau and U.S. Geological Survey; 4, Standard & Poor's; 5, U.S. Bureau of Economic Analysis and American Automobile Manufacturers Association; 6, Journal of Commerce and U.S. Geological Survey; 7, U.S. Census Bureau and U.S. Geological Survey; 8, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 9, Institute for Supply Management. Coincident: 1, Federal Reserve Board; 2, U.S. Census Bureau and U.S. Geological Survey; 3, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted, except 4 and 6 of the leading index.

r: Revised

CHART 4.

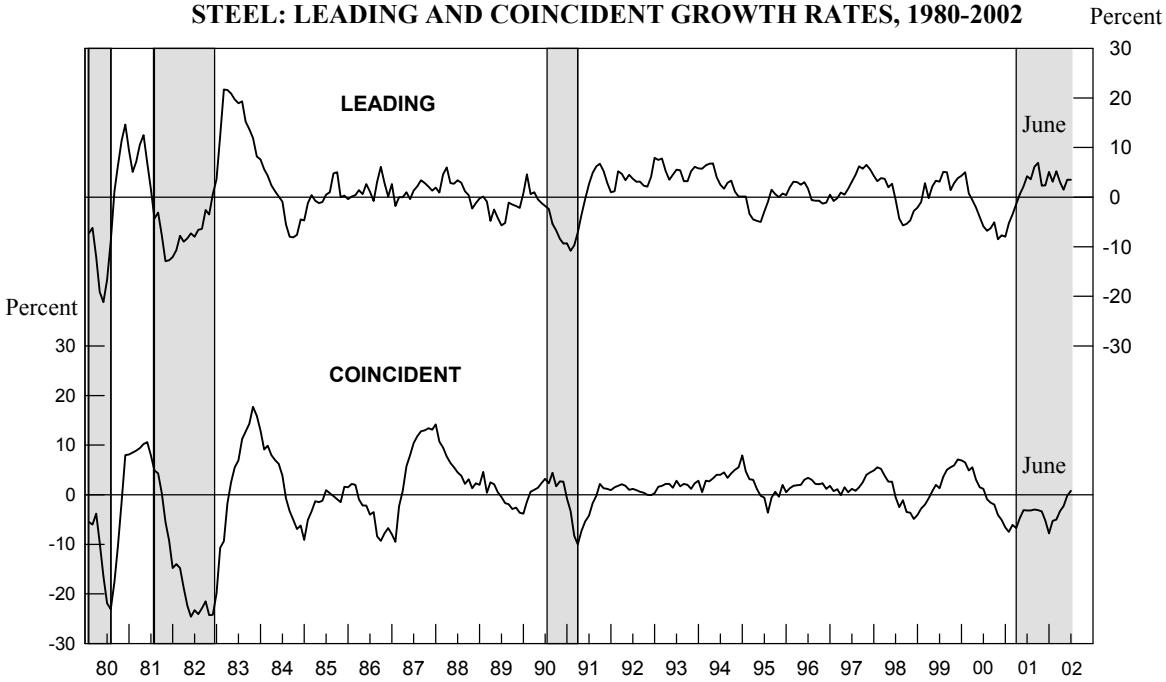
STEEL: LEADING AND COINCIDENT INDEXES, 1980-2002



Shaded areas are business cycle recessions. Asterisks (*) signify peaks (the end of an expansion) and troughs (the end of a downturn) in the economic activity reflected by the indexes.

CHART 5.

STEEL: LEADING AND COINCIDENT GROWTH RATES, 1980-2002



Shaded areas are business cycle recessions.

The growth rates are expressed as compound annual rates based on the ratio of the current month's index to its average level during the preceding 12 months.

U.S. Geological Survey, August 2002

Table 6.
The Aluminum Mill Products Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
2001				
July	167.4r	8.5r	145.5	1.9
August	167.2r	6.9r	143.5	-0.7
September	172.6r	12.3r	146.1	2.5
October	169.4r	7.2r	143.8	-0.8
November	169.6r	6.1r	141.6	-3.8
December	170.0r	5.2	142.1	-3.4
2002				
January	168.3	2.1r	143.1	-1.9
February	172.9r	6.7r	141.9	-3.2
March	170.8r	3.2	145.4r	1.5r
April	169.2	0.7r	144.3r	-0.3
May	170.7r	1.9r	143.6r	-0.6r
June	171.0	1.5	143.8	0.0

r: Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

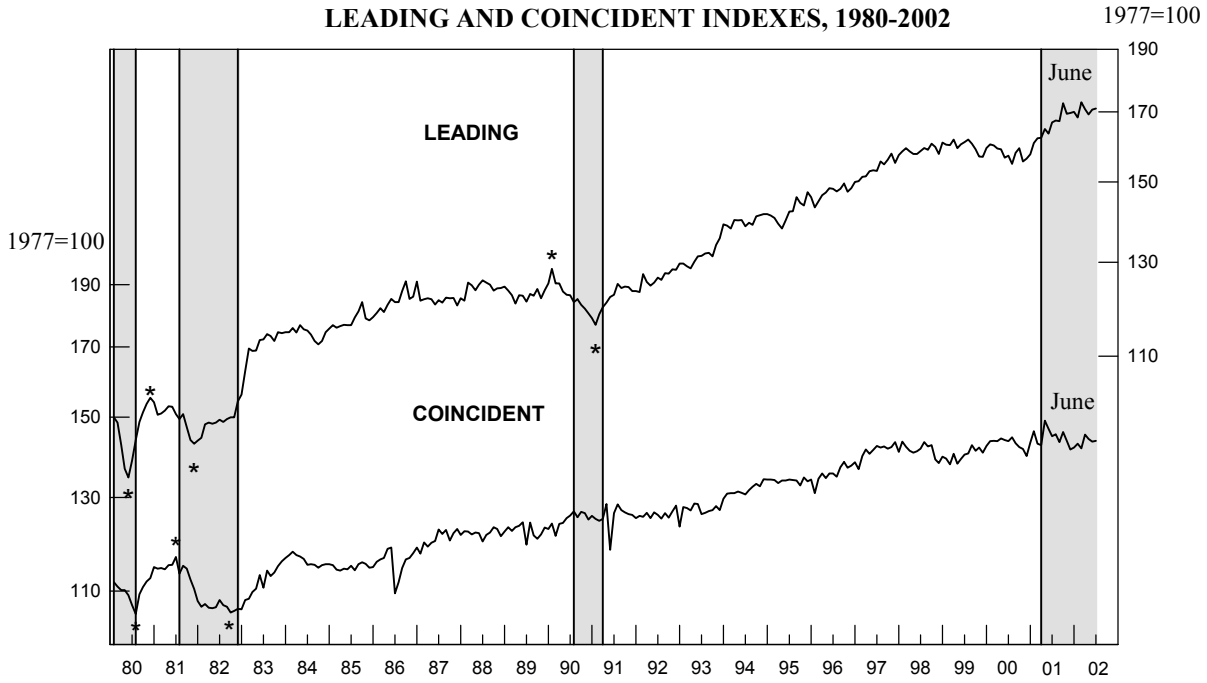
Table 7.
The Contribution of Each Aluminum Mill Products Index Component to the Percent Change in the Index from the Previous Month

Leading Index	**May**	**June**
1. Average weekly hours, aluminum sheet, plate, and foil (SIC 3353)	0.3r	-0.4
2. Index of new private housing units authorized by permit	0.2	0.1
3. Retail sales of U.S. passenger cars and light trucks (units)	-0.6r	0.2
4. Construction contracts, commercial and industrial (square feet)	-0.5	0.4
5. Net new orders for aluminum mill products (pounds)	0.2	-0.4
6. Growth rate of U.S. M2 money supply, 1996$	0.8	0.0
7. PMI	0.3	0.1
Trend adjustment	0.2	0.2
Percent change (except for rounding differences)	0.9r	0.2
Coincident Index		
1. Industrial production index, aluminum sheet, plate, and foil (SIC 3353)	-0.3	0.3
2. Total employee hours, aluminum sheet, plate, and foil (SIC 3353)	-0.3r	-0.3
Trend adjustment	0.2	0.2
Percent change (except for rounding differences)	-0.4r	0.2

Sources: Leading: 1, Bureau of Labor Statistics; 2, U.S. Census Bureau and U.S. Geological Survey; 3, U.S. Bureau of Economic Analysis and American Automobile Manufacturers Association; 4, F.W. Dodge, Division of McGraw-Hill Information Systems Company; 5, The Aluminum Association, Inc. and U.S. Geological Survey; 6, Federal Reserve Board, Conference Board, and U.S. Geological Survey; 7, Institute for Supply Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted.

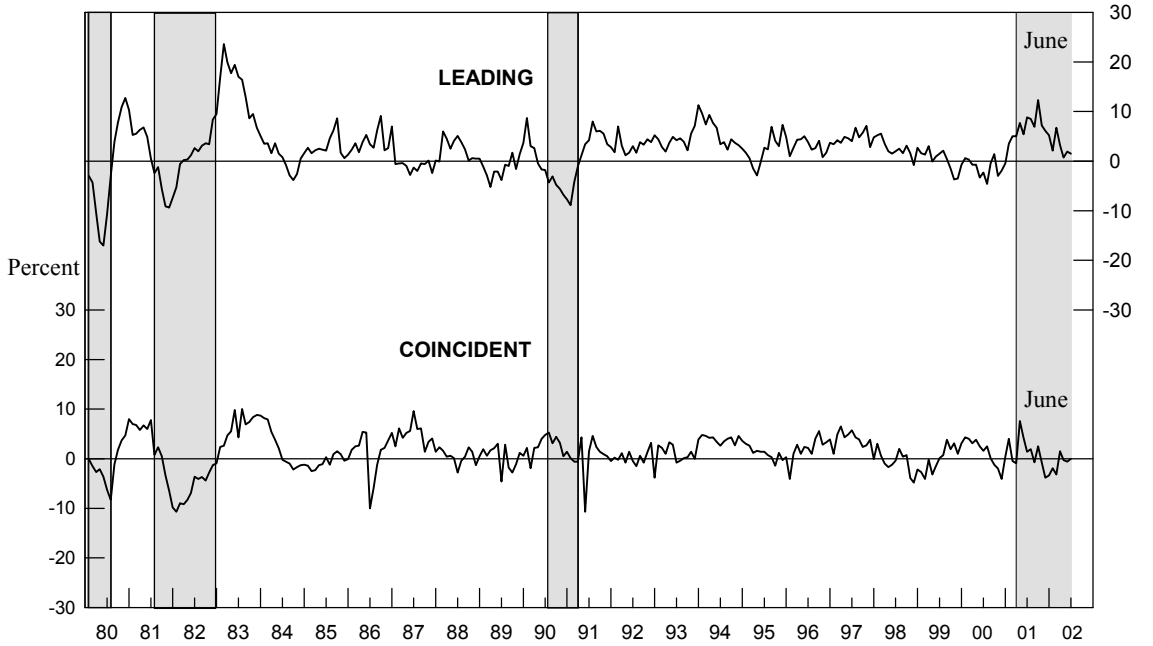
r: Revised

CHART 6.
ALUMINUM MILL PRODUCTS:
LEADING AND COINCIDENT INDEXES, 1980-2002



Shaded areas are business cycle recessions. Asterisks (*) signify peaks (the end of an expansion) and troughs (the end of a downturn) in the economic activity reflected by the indexes.

CHART 7.
ALUMINUM MILL PRODUCTS:
LEADING AND COINCIDENT GROWTH RATES, 1980-2002



Shaded areas are business cycle recessions.

The growth rates are expressed as compound annual rates based on the ratio of the current month's index to its average level during the preceding 12 months.

U.S. Geological Survey, August 2002

Table 8.
The Copper Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
2001				
July	114.4	0.4	120.0	-2.6
August	115.0	1.6	122.0	0.6
September	112.4	-2.6	120.8	-1.1
October	112.6	-1.8	122.0	1.0
November	114.3	0.9	121.3	-0.1
December	115.9	3.5	123.1	3.0
2002				
January	116.4	4.1	120.7	-1.4
February	117.8	6.2	119.2	-3.7
March	118.7	7.3	120.8r	-0.7
April	119.4	7.4	122.4r	1.9r
May	119.4r	6.5r	122.2	1.5r
June	118.4	4.1	121.5	0.3

r: Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

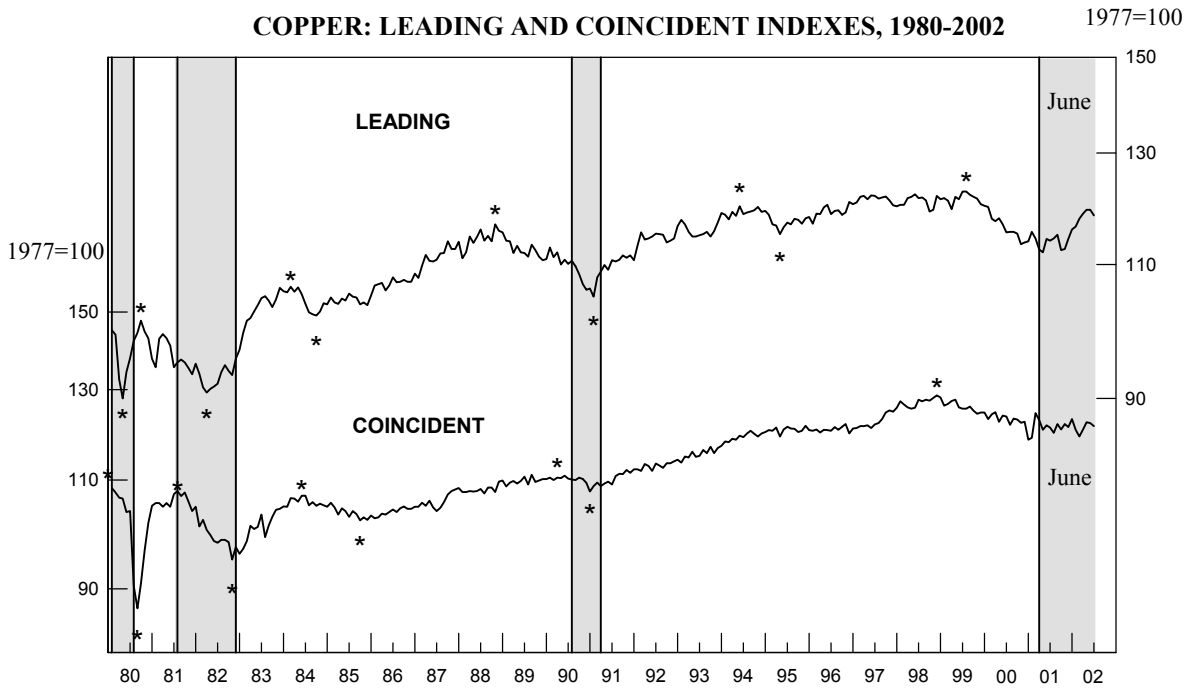
Table 9.
The Contribution of Each Copper Index Component to the Percent Change in the Index from the Previous Month

Leading Index	**May**	**June**
1. Average weekly overtime hours, rolling, drawing, and extruding of copper (SIC 3351)	-0.2	-0.3
2. New orders, nonferrous metal products, (NAICS 3313, 3314, & 335929) 1982$	0.0r	-0.2
3. S&P stock price index, building products companies	-0.1	-0.3
4. LME spot price of primary copper	0.1	0.1
5. Index of new private housing units authorized by permit	0.2	0.1
6. Spread between the U.S. 10-year Treasury Note and the federal funds rate	0.0	-0.2
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.0r	-0.8
Coincident Index		
1. Industrial production index, primary smelting and refining of copper (SIC 3331)	-0.1	-0.1
2. Total employee hours, rolling, drawing, and extruding of copper (SIC 3351)	-0.2	-0.3
3. Copper refiners' shipments (short tons)	0.2	-0.2
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.0	-0.5

Sources: Leading: 1, Bureau of Labor Statistics; 2, U.S. Census Bureau and U.S. Geological Survey; 3, Standard & Poor's; 4, London Metal Exchange; 5, U.S. Census Bureau and U.S. Geological Survey; 6, Federal Reserve Board and U.S. Geological Survey. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics; 3, American Bureau of Metal Statistics, Inc. and U.S. Geological Survey. All series are seasonally adjusted, except 3, 4, and 6 of the leading index.

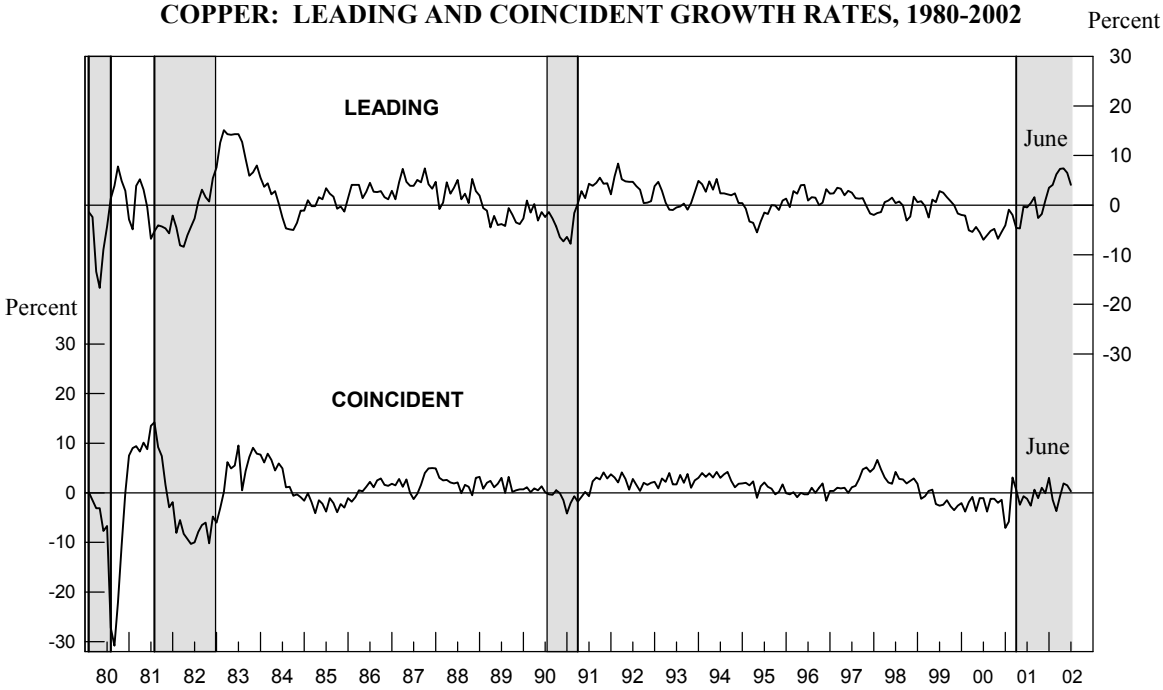
r: Revised

CHART 8.
COPPER: LEADING AND COINCIDENT INDEXES, 1980-2002



Shaded areas are business cycle recessions. Asterisks (*) signify peaks (the end of an expansion) and troughs (the end of a downturn) in the economic activity reflected by the indexes.

CHART 9.
COPPER: LEADING AND COINCIDENT GROWTH RATES, 1980-2002



Shaded areas are business cycle recessions.

The growth rates are expressed as compound annual rates based on the ratio of the current month's index to its average level during the preceding 12 months.

U.S. Geological Survey, August 2002

Explanation

Each month, the U.S. Geological Survey tracks the effects of the business cycle on five U.S. metal industries by calculating and publishing composite indexes of leading and coincident indicators. Wesley Mitchell and Arthur Burns originated the cyclical-indicators approach for the economy as a whole at the National Bureau of Economic Research in the mid-1930s. Over subsequent decades this approach was developed and refined, mostly at the National Bureau, under the leadership of Geoffrey H. Moore.[1]

A business cycle can briefly be described as growth in the level of economic activity followed by a decline succeeded by further growth. These alternating periods of growth and decline do not occur at regular intervals. Composite indexes, however, can help determine when highs and lows in the cycle might occur. A composite index combines cyclical indicators of diverse economic activity into one index, giving decision makers and economists a single measure of how changes in the business cycle are affecting economic activity.

The indicators in the metal industry leading indexes historically give signals several months in advance of major changes in a coincident index, a measure of current metal industry activity. Indicators that make up the leading indexes are, for the most part, measures of anticipations or new commitments to various economic activities that can affect the metal industries in the months ahead.

Composite coincident indexes for the metal industries consist of indicators for production, shipments, and total employee hours worked. As such, the coincident indexes can be regarded as measures of the economic health of the metal industries.

The metal industry coincident indexes reflect industry activity classified by the U.S. Standard Industrial Classification (SIC) and the North American Industry Classification System (NAICS). Of the five metal industries, primary metals (NAICS 331) is the broadest, containing 25 different metal processing industries. Steel, aluminum, and copper are specific industries within the primary metals group.

The SIC was the main vehicle used by the U.S. Government and others in reporting industry economic statistics throughout most of the last century. Starting with the 1997 U.S. Economic Census, the U.S. Government began using the NAICS, which classifies economic data for industries in Canada, Mexico, and the United States. In general, metal industry indexes starting in 1997 begin to reflect the NAICS classification, while indexes for earlier years follow the SIC. Hence, composite indexes from 1997 forward are not entirely consistent with those of earlier years.

The largest change to primary metals because of the NAICS deals with other communication and energy wire manufacturing (NAICS 335929). Under NAICS, this manufacturing has been removed from primary metals and added to electrical equipment, appliance, and component manufacturing. Because monthly shipments and new orders for this wire are not available, the USGS is estimating their values from 1997 onward and adding them to the appropriate metal industry indicators and indexes to maintain consistency.

[1]**Business Cycle Indicators, A monthly report from The Conference Board** (March 1996).

There are other small changes to the primary metals industry because of the switch to the NAICS. Coke oven activity not done by steel mills, for example, is removed and alumina refining, a part of industrial inorganic chemical manufacturing under the SIC, is added. Since the historic trends of the composite indexes are not affected by these small changes, the USGS is not making specific adjustments to the indexes for them for the periods before and after 1997.

The metal industry leading indexes turn before their respective coincident indexes an average of 8 months for primary metals and 7 months for steel and copper. The average lead time for the primary aluminum leading index is 6 to 8 months, and the average lead time for the aluminum mill products leading index is 6 months.

The leading index of metal prices, also published in the *Metal Industry Indicators*, is designed to signal changes in a composite index of prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange. On average, this leading index indicates significant changes in price growth about 8 months in advance.

The growth rate used in the *Metal Industry Indicators* is a 6-month smoothed growth rate at a compound annual rate, calculated from a moving average. Moving averages smooth fluctuations in data over time so that trends can be observed. The 6-month smoothed growth rate is based upon the ratio of the latest monthly value to the preceding 12-month moving average.

$$\left[\left(\frac{\textit{current value}}{\textit{preceding 12-month moving average}}\right)^{\frac{12}{6.5}} - 1.0\right] * 100$$

Because the interval between midpoints of the current month and the preceding 12 months is 6.5 months, the ratio is raised to the 12/6.5 power to derive a compound annual rate.

The growth rates measure the near-term industry trends. They, along with other information about the metal industries and the world economy, are the main tools used to determine the outlook of the industries. A 6-month smoothed growth rate above +1.0% usually means increasing growth; a rate below –1.0% usually means declining growth.

The next summary is scheduled for release on the World Wide Web at 10:00 a.m. EDT, Friday, September 20. The address for *Metal Industry Indicators* on the World Wide Web is: http://minerals.usgs.gov/minerals/pubs/mii/

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